

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Katsuya SHIMOMURA et al.

Serial No. 09/950,060

Filed September 12, 2001

LOUDSPEAKER



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**Confirmation No. 1528**

**Attn: Application Branch**

**Attorney Docket No. 2001\_1279A**

**FIRST PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents,  
Washington, DC 20231

THE COMMISSIONER IS AUTHORIZED  
TO CHARGE ANY DEFICIENCY IN THE  
FEES FOR THIS PAPER TO DEPOSIT  
ACCOUNT NO. 23-0975

Sir:

Please amend the above-identified U.S. Patent application as follows:

**IN THE CLAIMS**

**Please amend claims 6 and 7 as follows.**

6. (Amended) The loudspeaker of claim 1, wherein said magnetic circuit is an inner magnet type magnetic circuit comprising a yoke, a magnet and a plate, said magnet and said plate being overlaid in the central part of said yoke, and said yoke comprising a unit for bottom section and a unit for outer cylindrical section.

7. (Amended) The loudspeaker of claim 1, wherein said magnetic circuit is further provided with a heat radiator.

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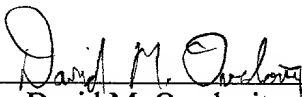
**REMARKS**

The present Preliminary Amendment is submitted to delete the multiple dependency of the claims, thereby placing such claims in condition for examination and reducing the required PTO filing fee.

Attached hereto is a marked-up version of the changes made to the claims by the current Preliminary Amendment labeled "**Version With Markings to Show Changes Made**".

Respectfully submitted,

Katsuya SHIMOMURA et al.

By   
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December 13, 2001

**Version with Markings to**  
**Show Changes Made**

6. (Amended) The loudspeaker of [either one of claims] claim 1 [through 5], wherein said magnetic circuit is an inner magnet type magnetic circuit comprising a yoke, a magnet and a plate, said magnet and said plate being overlaid in the central part of said yoke, and said yoke comprising a unit for bottom section and a unit for outer cylindrical section.

7. (Amended) The loudspeaker of [either one of claims] claim 1 [though 5], wherein said magnetic circuit is further provided with a heat radiator.

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LOUDSPEAKER



Confirmation No. 1528

Attn: Application Branch

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**SECOND PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents,  
Washington, DC 20231

THE COMMISSIONER IS AUTHORIZED  
TO CHARGE ANY DEFICIENCY IN THE  
FEES FOR THIS PAPER TO DEPOSIT  
ACCOUNT NO. 23-0975

Sir:

Please amend the above-identified U.S. Patent application as follows:

**IN THE ABSTRACT**

Please replace the original abstract with the enclosed substitute abstract.

**IN THE SPECIFICATION**

Please replace the original specification with the enclosed substitute specification.

**IN THE CLAIMS**

Please cancel claims 1-9 without prejudice or disclaimer to the subject matter therein.

Please add new claims 10-45 as follows.

10. A loudspeaker comprising:

a magnetic circuit having a magnetic gap and a yoke;

a frame having an elastic fastener, said frame coupled to said magnetic circuit by said elastic fastener;

a voice coil inserted in the magnetic gap of said magnetic circuit; and

a diaphragm connected to said voice coil.

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11. The loudspeaker of claim 10, wherein an inner circumference of said frame is provided with said elastic fastener and said frame has at least one additional elastic fastener, said elastic fastener and said at least one additional elastic fastener coupling said frame with said yoke.

12. The loudspeaker of claim 11, further comprising an adhesive material for bonding said yoke to said frame.

13. The loudspeaker of claim 10, wherein said frame is made of plastic.

14. The loudspeaker of claim 10, wherein said yoke comprises an outer cylindrical portion and a bottom portion, wherein said bottom portion is fitted to said outer cylindrical portion at a step provided at said outer cylindrical portion.

15. The loudspeaker of claim 14, wherein said yoke is formed by caulking a bottom end of said outer cylindrical portion around a tapered part provided at an edge of an outer circumference of said bottom portion.

16. The loudspeaker of claim 14, wherein said bottom portion of said yoke has a lift-up at a central part of said yoke, a magnet, and a plate overlaid on said bottom portion.

17. The loudspeaker of claim 10, wherein said magnetic circuit is an inner magnet type magnetic circuit comprising said yoke, a magnet and a plate, said magnet and said plate being overlaid in a central part of said yoke.

18. The loudspeaker of claim 10, wherein said magnetic circuit further comprises a heat radiator.

19. The loudspeaker of claim 18, wherein said heat radiator is a cap made of copper material disposed so that an end of said cap makes contact with a bottom portion of said yoke in said magnetic circuit.

20. The loudspeaker of claim 18, wherein said heat radiator is a cap made of copper material having a protrusion protruding into a space of said voice coil.

21. The loudspeaker of claim 18, wherein said heat radiator is a ring made of copper material attached to an outer cylindrical portion of said yoke.

22. The loudspeaker of claim 10, wherein at least an outer circumferential portion of said yoke is exposed and extruding from said frame.

23. The loudspeaker of claim 10, wherein said voice coil has a cap and a perforation provided at a location of said voice coil lower than a level where a damper is connected.

24. The loudspeaker of claim 23, wherein the perforation sinks into the magnetic gap when said diaphragm vibrates.

25. The loudspeaker of claim 10, wherein a bottom portion of said yoke has a groove at an outer circumference.

26. A loudspeaker comprising:  
a magnetic circuit having a magnetic gap and a yoke, said yoke having a caulking portion;  
a frame provided with a hole;  
a voice coil inserted in the magnetic gap of said magnetic circuit; and  
a diaphragm connected to said voice coil,  
wherein said caulking portion is inserted through the hole in said fame and said caulking portion is expanded in the hole in said frame so as to connect the yoke and said frame.

27. The loudspeaker of claim 26, wherein said frame is made of plastic.

28. The loudspeaker of claim 26, wherein said magnetic circuit is an inner magnet type magnetic circuit comprising said yoke, a magnet and a plate, said magnet and said plate being overlaid in a central part of said yoke.

29. The loudspeaker of claim 26, wherein said magnetic circuit further comprises a heat radiator.

30. A loudspeaker comprising:  
a magnetic circuit having a yoke and a magnetic gap, wherein said yoke has an expansion;  
a frame having a clip section, said frame being coupled to said yoke of said magnetic circuit by said clip section and said expansion;  
a voice coil inserted in the magnetic gap of said magnetic circuit; and  
a diaphragm connected to said voice coil,  
wherein said expansion is inserted underneath said clip section by a revolving action.

31. The loudspeaker of claim 30, wherein said frame has at least one additional clip section and said yoke has at least one additional expansion for coupling said frame to said yoke.

32. The loudspeaker of claim 30, wherein said frame is made of plastic.

33. The loudspeaker of claim 30, wherein said yoke comprises an outer cylindrical portion and a bottom portion, wherein said bottom portion is fitted to said outer cylindrical portion at a step provided at said outer cylindrical portion.

34. The loudspeaker of claim 33, wherein said yoke is formed by caulking a bottom end of said outer cylindrical portion around a tapered part provided at an edge of an outer circumference of said bottom portion.

35. The loudspeaker of claim 33, wherein said bottom portion of said yoke has a lift-up at a central part of said yoke, a magnet, and a plate overlaid on said bottom portion.

36. The loudspeaker of claim 30, wherein said magnetic circuit is an inner magnet type magnetic circuit comprising said yoke, a magnet and a plate, said magnet and said plate being overlaid in a central part of said yoke.

37. The loudspeaker of claim 30, wherein said magnetic circuit further comprises a heat radiator.

38. The loudspeaker of claim 30, wherein said plate further comprises a stopper for said yoke.

39. The loudspeaker of claim 37, wherein said heat radiator is a cap made of copper material disposed so that an end of said cap makes contact with a bottom portion of said yoke in said magnetic circuit.

40. The loudspeaker of claim 37, wherein said heat radiator is a cap made of copper material having a protrusion protruding into a space of said voice coil.

41. The loudspeaker of claim 37, wherein said heat radiator is a ring made of copper material attached to an outer cylindrical portion of said yoke.

42. The loudspeaker of claim 30, wherein at least an outer circumferential portion of said yoke is exposed and extruding from said frame.

43. The loudspeaker of claim 30, wherein said voice coil has a cap and a perforation provided at a location of said voice coil lower than a level where a damper is connected.



44. The loudspeaker of claim 43, wherein the perforation sinks into the magnetic gap when said diaphragm vibrates.

45. The loudspeaker of claim 30, wherein a bottom portion of said yoke has a groove at an outer circumference.

**REMARKS**

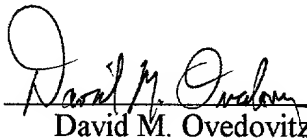
In view of the above-amendments and the following remarks, examination on the merits is respectfully requested.

The specification and abstract have been reviewed and revised to make a number of editorial revisions. Due to the number of changes involved, a substitute specification and abstract have been prepared and are submitted herewith. No new matter has been added. Enclosed is a marked-up copy of the original specification and abstract labeled "**Version with Markings to Show Changes Made**" indicating the same changes incorporated into the substitute specification and abstract.

Original claims 1-9 have been cancelled and are replaced with new claims 10-45 for examination. It is submitted that new claims 10-45 do not add new matter to the application. As a result, examination of these claims on the merits is respectfully requested.

Respectfully submitted,

Katsuya SHIMOMURA et al.

By   
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